

Redox Practice Problems

For each of following skeletal redox reactions:

- Identify the oxidized species and state how many electrons are lost per atom
- Identify the reduced species and state how many electrons are gained per atom
- Identify the oxidizing agent
- Identify the reducing agent
- Write balanced half reactions (in acid)
- Write a balanced redox reaction (in acid)
- Write a balanced redox reaction (in base)

- $\text{MnO}_4^- (\text{aq}) + \text{H}_2\text{O}_2 (\text{l}) \rightarrow \text{Mn}^{2+} (\text{aq}) + \text{O}_2 (\text{g})$
- $\text{CrO}_4^{2-} (\text{aq}) + \text{Cu} (\text{s}) \rightarrow \text{Cr}(\text{OH})_3 (\text{s}) + \text{Cu}(\text{OH})_2 (\text{s})$
- $\text{AsO}_4^{3-} (\text{aq}) + \text{NO}_2^- (\text{l}) \rightarrow \text{AsO}_2^- (\text{aq}) + \text{NO}_3^- (\text{l})$
- $\text{BH}_4^- (\text{aq}) + \text{ClO}_3^- (\text{aq}) \rightarrow \text{H}_2\text{BO}_3^- (\text{aq}) + \text{Cl}^- (\text{aq})$
- $\text{CrO}_4^{2-} (\text{aq}) + \text{N}_2\text{O} (\text{g}) \rightarrow \text{Cr}^{3+} (\text{aq}) + \text{NO} (\text{g})$
- $\text{Br}_2 (\text{l}) \rightarrow \text{BrO}_3^- (\text{aq}) + \text{Br}^- (\text{aq})$
- $\text{NO}_2 (\text{g}) \rightarrow \text{NO}_3^- (\text{aq}) + \text{NO}_2 (\text{g})$
- $\text{Zn} (\text{s}) + \text{NO}_3^- (\text{aq}) \rightarrow \text{Zn}(\text{OH})_4^{2-} (\text{s}) + \text{NH}_3 (\text{g})$
- $\text{SO}_3^{2-} (\text{aq}) + \text{Cl}_2 (\text{g}) \rightarrow \text{SO}_4^{2-} (\text{aq}) + \text{Cl}^- (\text{aq})$
- $\text{Fe}(\text{CN})_6^{3-} (\text{aq}) + \text{Re} (\text{s}) \rightarrow \text{Fe}(\text{CN})_6^{4-} (\text{aq}) + \text{ReO}_4^- (\text{g})$
- $\text{MnO}_4^- (\text{aq}) + \text{HCOOH} (\text{aq}) \rightarrow \text{Mn}^{2+} (\text{aq}) + \text{CO}_2 (\text{g})$
- $\text{Mn}^{2+} (\text{aq}) + \text{Co}^{3+} (\text{aq}) \rightarrow \text{MnO}_2 (\text{s}) + \text{Co}^{2+} (\text{aq})$